What is claimed is:

1. A method of limiting the movement of a robot, said method comprising the steps of:

defining in a memory a virtual safety barrier including a trajectory of a work or tool mounted on a wrist of a robot in operation;

defining at least two three-dimensional spatial regions including parts of the robot including said work or tool;

matching a predicted position of said defined three-dimensional spatial region, which is obtained by trajectory calculations, with said virtual safety barrier; and

carrying out a control to stop the movement of the arm including any one of the three-dimensional spatial regions if at least part of the predicted position, which is obtained by trajectory calculations, of any one of the defined three-dimensional spatial regions is included in said virtual safety barrier.

2. The method of limiting the movement of a robot according to claim 1, wherein said three-dimensional spatial regions are defined either by a set of points, a set of lines, or an envelope sphere.

3. A robot movement limiting apparatus comprising:

means for defining in a memory a virtual safety barrier including a movement trajectory of a work or tool mounted on the wrist of a robot in operation;

means for defining at least two three-dimensional spatial regions including a part of the robot including said work or tool;

means for calculating a predicted position of each of said three-dimensional spatial regions that have been defined, on a movement trajectory;

means for matching the predicted position of each three-dimensional

spatial region with said virtual safety barrier;

means for determining whether or not at least a part of the predicted position of any one of the defined three-dimensional spatial regions, based on trajectory calculations, is included in said virtual safety barrier; and

control means for stopping the movement of the arm including the three-dimensional spatial region if it is determined that at least a part of the predicted position of the three-dimensional spatial region is included in said virtual safety barrier.

4. The robot movement limiting apparatus according to claim 2, wherein said three-dimensional spatial regions are defined either by a set of points, a set of lines, or an envelope sphere.

5. A robot having the robot movement limiting apparatus according to claim 3 or 4 as part of a control device.

6. A robot having a control device and two or more robots according to claim 5 that are controlled by said control device, wherein said means for defining in the memory said virtual safety barrier for each robot is capable of setting various margins for said virtual safety barrier.

7. A method of limiting the movement of a robot, comprising the steps of:

acquiring, as a reference value, a movement trajectory in each step at one or more locations including a work or tool mounted on a wrist of a robot by operating the robot once;

setting a boundary value for each step by adding a margin to said reference value;

determining whether any one of measured values in individual steps during the subsequent operations of the robot is within corresponding one of said

boundary values; and

effecting a control to stop the movement of the robot arm if any one of the measured values exceeds the corresponding boundary values.